

# Federal Defenders OF NEW YORK, INC.

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March 24, 2025

By E-Mail and ECF

Tara McGrath  
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Assistant U.S. Attorneys  
Eastern District of New York  
275 Cadman Plaza East  
Brooklyn, NY 11201

Re: *United States v. Johnston*, 23 Cr. 13 (NRM)

Dear Counsel:

Pursuant to Rule 16(b)(1)(C) of the Federal Rules of Criminal Procedure, the defense hereby provides supplemental expert notice for Dr. Julia Burrill. Please find a signed supplemental expert disclosure for Dr. Burrill attached. The defense reserves the right to further supplement and/or correct this disclosure if appropriate, particularly once the Court's ruling on the defense's *Daubert* motion is received. *See* Fed. R. Crim. P. 16(a)(1)(G)(vi).

Very Truly Yours,

/s/

Marissa Sherman  
Deirdre D. von Dornum  
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cc: Clerk of Court (by ECF)

SUPPLEMENTAL EXPERT DISCLOSURE AS TO JULIA BURRILL, PH.D.

I. STATEMENT OF OPINIONS, BASES AND REASONS

We may call, if such testimony becomes relevant at trial, Dr. Julia Burrill as an expert in forensic biology and DNA transfer, persistence, prevalence and recovery. Her testimony will be based on her training, scientific experience, research, relevant academic literature, the DNA case file, and case information verbally provided by counsel.

Dr. Burrill is expected to testify on the following topics and provide the following opinions:

**Recovery.** As stated in Dr. Burrill's affidavit (filed at ECF No. 135-1):

Scientific research supports the use of "substrate control" testing to provide contextual information, particularly when household items are being tested. This would include multiple DNA samples of non-stained adjacent areas of the item (here, the comforter) being tested to contribute to an understanding of the background level of DNA on this item or illuminate the presence of inhabitants' DNA in areas not associated with a positive serological test result. The absence of this contextual information further contributes to uncertainty about how any particular DNA profile came to be present on a communal item.

Case notes indicate that the sampling of the comforter was not intended to recover and test for "touch DNA." The intent of the analyst does not prevent the recovery and detection of "touch DNA" should it be present on the sampled surfaces. A standard DNA processing methodology, such as that which appears to have been used for the F1 fractions in this case, could result in DNA detection from any bodily fluid or contact deposition.

In forming these opinions, Dr. Burrill relies on her 16 years of experience in forensic science, her education and training, her own research, and the relevant academic literature, including, but not limited to: Van Oorschot, Roland AH, Bianca Szkuta, Georgina E. Meakin, Bas Kokshoorn, and Mariya Goray. "DNA transfer in forensic science: a review." *Forensic Science International: Genetics* 38 (2019): 140-166.

**Transfer.** As stated in Dr. Burrill's affidavit (filed at ECF No. 135-1):

Transfer of DNA occurs regularly in the course of everyday activities. It is common that people who cohabit will deposit their DNA on numerous communal items and surfaces in the home. Those items and surfaces may come into contact with others and result in further transfer of the deposited DNA. Therefore, the presence of an individual's DNA profile on items in their own home can be regularly observed whether or not they came into direct contact with that item. A household item such as the comforter from the parents' bed could be expected to have come into direct contact with both parents and any children residing in the home. The evidence notes indicated that, per Monica Johnston, the children in the home were in contact with the bed for play. Any direct contact with the comforter could

result in the transfer of not only that individual's DNA but also any DNA they had accumulated on their hands or body preceding this contact. This could include secondary or higher level transferred DNA obtained from other individuals as well as the home environment.

In forming these opinions, Dr. Burrill relies on her 16 years of experience in forensic science, her education and training, her own research, and the relevant academic literature, including, but not limited to: Goray, Mariya, Bas Kokshoorn, Kristy Steensma, Bianca Szkuta, and Roland AH van Oorschot. "DNA detection of a temporary and original user of an office space." *Forensic Science International: Genetics* 44 (2020): 102203; Reither, Jack B., Emma Gray, Annalisa Durdle, Xavier A. Conlan, Roland AH van Oorschot, and Bianca Szkuta. "Investigation into the prevalence of background DNA on flooring within houses and its transfer to a contacting surface." *Forensic Science International* 318 (2021): 110563; Szkuta, Bianca, J. B. Reither, X. A. Conlan, and R. A. H. van Oorschot. "The presence of background DNA on common entry points to homes." *Forensic Science International: Genetics Supplement Series* 7, no. 1 (2019): 784-786.

**Persistence.** As stated in Dr. Burrill's affidavit (filed at ECF No. 135-1):

The timing of any previous contact with the comforter by parents or by any of the four cohabitating children is unknown. The persistence of any previously deposited DNA on the comforter is also unknown, meaning it cannot reliably be inferred how any particular DNA within a mixture got there or how long it had been there, or if distinct profiles of DNA were deposited concurrently. Given the lack of context for the DNA transfer and the potential for considerable background DNA on such a large item, there is no basis for a conclusion that a specific contact, action, or behavior resulted in the DNA recovered and tested in this case. In particular, if semen is indicated as being present on the comforter based on a PSA test, PSA is a relatively stable protein and has been reported to be detected on fabric weeks after its deposit. Positive PSA test results have also been reported from stains after they have been laundered. Case notes indicate that the comforter had not been laundered between the alleged incident and the collection. No information is available on when or if it was laundered prior to the alleged incident.

In forming these opinions, Dr. Burrill relies on her 16 years of experience in forensic science, her education and training, her own research, and the relevant academic literature, including, but not limited to: Karadayı, Şükriye, Beytullah Karadayı, Dilara Öner, and Gürsel Çetin. "Evaluation of the relationship between the detectability of seminal stains on laundered fabric and stain age." *Medicine, Science and the Law* 61, no. 3 (2021): 198-207.

**Serological and DNA testing cannot provide information about when or how particular biological material came to be on a household item.** As stated in Dr. Burrill's affidavit (filed at ECF No. 135-1):

Conclusions about specific behavior based on the inference of an individual's DNA in DNA mixture sample from a communal home is unwarranted. This is due to the complexity of both

the mechanisms of DNA transfer and the potential “background” or environmental DNA presence on any item tested. With respect to semen in particular, if semen is indicated to be present in a portion of the spots tested from the comforter, neither serological nor DNA testing provides any indication of how it got there. Presence of spots of seminal fluid does not necessarily indicate sexual ejaculation at that location. Although the location of these stains on the parents’ bed comforter may provide its own explanation (of previous individual or joint sexual contact), it should be noted that seminal fluid may be present on a personal surface such as bedding for other reasons. Those reasons may include spontaneous or nocturnal emission, secondary transfer of ejaculate from elsewhere, or contaminating contact during laundering/bedmaking or similar routine household procedures.

In forming these opinions, Dr. Burrill relies on her 16 years of experience in forensic science, her education and training, her own research, and the relevant academic literature, including, but not limited to: Van Oorschot, Roland AH, Bianca Szkuta, Georgina E. Meakin, Bas Kokshoorn, and Mariya Goray. "DNA transfer in forensic science: a review." *Forensic Science International: Genetics* 38 (2019): 140-166; Cahill, Amy, Luke Volgin, Roland AH van Oorschot, Duncan Taylor, and Mariya Goray. "Where did it go? A study of DNA transfer in a social setting." *Forensic Science International: Genetics* 73 (2024): 103101; Abdel-Hamid, Ibrahim A., and Omar I. Ali. "Spontaneous ejaculation: a focused review for the clinicians." *Sexual Medicine Reviews* 9, no. 3 (2021): 406-422; Finnis, Jonathan, Geraldine Davidson, Karen Alexander, Jennie Lewis, Maggie Boyce, Finlay Kennedy, David Casey et al., "Evaluation of indirect transfer mechanisms of semen under varying test conditions." *Science & Justice* 64, no. 1 (2024): 95-103; 18 Karadayi, Sukriye, Elnaz Moshfeghi, Tulin Arasoglu, and Beytullah Karadayi. "Evaluating the persistence of laundered semen stains on fabric using a forensic light source system, prostate-specific antigen Semiquant test and DNA recovery-profiling." *Medicine, Science and the Law* 60, no. 2 (2020): 122-130.

**Caution should be used when reporting that semen is “identified” based on positive serological tests without visual observation of spermatozoa.** As stated in Dr. Burrill’s affidavit (filed at ECF No. 135-1):

Caution should be used when reporting that a stain is “identified” based on a presumptive Acid Phosphatase (AP) and Prostate-Specific Antigen (PSA) card test in the absence of visual confirmation of spermatozoa. The absence of these cells makes confirmatory testing of potential semen from vasectomized individuals challenging. AP is present in many bodily fluids and household products. PSA can be present in bodily fluids other than semen, such as breast milk, vaginal fluid, urine and fecal matter. Particular caution should be exercised where no quantitative data is provided about the level of PSA detected in a particular sample. I am aware of some laboratory protocols which indicate that a PSA test is confirmatory for the presence of semen (DC Department of Forensic Sciences), some which clearly state that a positive result does not confirm the presence of semen (New York Office of the Chief Medical Examiner, Las Vegas Metropolitan Police Department).

In forming these opinions, Dr. Burrill relies on her 16 years of experience in forensic science, her education and training, her own research, relevant test and laboratory protocols and the

relevant academic literature, including, but not limited to: Harbison, SA, and RI Fleming. 2016. "Forensic Body Fluid Identification: State of the Art." *Research and Reports in Forensic Medical Science* 6 (February): 11–23. doi:10.2147/RRFMS.S57994; Lunetta, Philippe, and Helmuth Sippel. "Positive prostate-specific antigen (PSA) reaction in post-mortem rectal swabs: a cautionary note." *Journal of forensic and legal medicine* 16, no. 7 (2009): 397-399; Yu, He, and Eleftherios P. Diamandis. "Prostate-specific antigen in milk of lactating women." *Clinical chemistry* 41, no. 1 (1995):54-58; DC DFS. FBS06. Available at:[https://dfs.dc.gov/sites/default/files/dc/\\_sites/dfs/page\\_content/attachments/FBS06%20P30%20Testing.pdf](https://dfs.dc.gov/sites/default/files/dc/_sites/dfs/page_content/attachments/FBS06%20P30%20Testing.pdf); NYC OCME. Forensic Biology Serology Procedures Manuals, "Seratec PSA-Semiquant and a-Amylase Tests effective 06/25/19 current." Available at:  
<https://www.nyc.gov/site/ocme/services/fbio-serology-procedures-manuals.page>; Las Vegas Metropolitan Police Department Biology/DNA Procedures Manual (2024), 2.14.2, 12.6.1 ; SERATEC®, PSA In Body Fluids, available at [https://www.seratec.com/docs/user\\_instructions/psa\\_in\\_body\\_fluids](https://www.seratec.com/docs/user_instructions/psa_in_body_fluids).

**Allele Sharing makes analysis of DNA samples more challenging.** As stated in Dr. Burrill's affidavit (filed at ECF No. 135-1):

Individuals who are closely biologically related (parents and children, siblings, etc.) typically share more alleles than unrelated individuals. The presence of known close biological relatives in a mixture makes allele sharing more likely, which undermines the interpretive value of any particular allele's peak height. The number of contributors to a DNA sample becomes more difficult to estimate when the number of peaks at a locus and the ratio of peak heights are obfuscated by an unknown number of shared alleles. Where there are multiple possible related contributors to a DNA mixture, reliable analysis of the number of contributors is difficult.

In forming these opinions, Dr. Burrill relies on her 16 years of experience in forensic science, her education and training, her own research, and the relevant academic literature, including, but not limited to: Hicklin, R. Austin, Nicole Richetelli, Brandi L. Emerick, Robert A. Bever, and Jonathan M. Davoren. "Variation in assessments of suitability and number of contributors for DNA mixtures." *Forensic Science International: Genetics* 65 (2023): 102892; Butler, John M. *Advanced topics in forensic DNA typing: interpretation*. Academic Press, 2014.

## II. QUALIFICATIONS

The following is a list of "the witness's qualifications, including a list of all publications authored in the previous 10 years," Fed. R. Crim. P. 16(a)(1)(G)(iii):

Dr. Burrill's qualifications are documented in her curriculum vitae, which was previously filed at ECF 135-1.

Dr. Burrill's publications include:

Burrill, J., Daniel, B., & Frascione, N. (2022). Lysis and purification methods for increased recovery of degraded DNA from touch deposit swabs. *Forensic Science International*, 330, 111102.

Burrill, J., Hotta, R., Daniel, B., & Frascione, N. (2021). Accumulation of endogenous and exogenous nucleic acids in “Touch DNA” components on hands. *Electrophoresis*, 42 (16), 1594-1604.

Burrill, J., Rammenou, E., Alawar, F., Daniel, B., & Frascione, N. (2020). Corneocyte lysis and fragmented DNA considerations for the cellular component of forensic touch DNA. *Forensic Science International: Genetics*, 51, 102428.

Burrill, J., Kombara, A., Daniel, B., & Frascione, N. (2020). Exploration of cell-free DNA (cfDNA) recovery for touch deposits. *Forensic Science International: Genetics*, 51, 102431.

Burrill, J., Daniel, B., & Frascione, N. (2020). Illuminating touch deposits through cellular characterization of hand rinses and body fluids with nucleic acid fluorescence. *Forensic Science International: Genetics*, 46, 102269.

Burrill, J., Daniel, B., & Frascione, N. (2019). A review of trace “Touch DNA” deposits: Variability factors and an exploration of cellular composition. *Forensic Science International: Genetics*, 39, 8-18.

### III. LIST OF CASES

Please find below a “list of all other cases in which, during the previous 4 years, the witness has testified as an expert at trial or by deposition,” Fed. R. Crim. P. 16(a)(1)(G)(iii):

Dr. Burrill has not testified as an expert at trial or by deposition during the previous four years.

Dated: March 23, 2025

Respectfully submitted,



Julia Burrill, Ph.D.